

# Tracing the Fingerprints of Bioterrorism

Argonne's **Biodetection  
Technologies Team**



Argonne's Biodetection Technologies Team has developed a new tool in the fight against bioterrorism: an advanced biochip that can reveal clues about how anthrax and other biochemical threats are created.

# Argonne's BIODETECTION Technologies Team



Argonne immunologist Dan Schabacker (left) and bioengineer Aeraj ul Haque test a biochip that analyzes protein to provide details on the origins of biochemical threats.

Argonne's innovative biochip will improve how we trace the origins of bioterrorist attacks and other biocrimes.

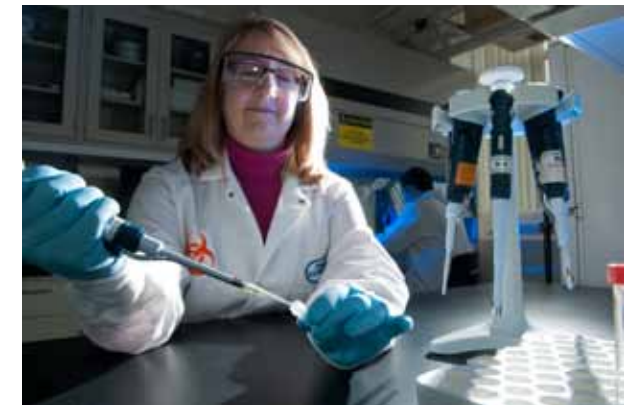
Current biodetection technologies use DNA analysis to identify biological agents. The Argonne-developed biochip takes microbial forensics a step further by incorporating a proteomics analysis (the study of proteins). This provides much more detail about biological agents, including the specific organism used, growth conditions and preparation methods. Loyola University Medical Center is collaborating on this project.

Evidence from a proteomic analysis would immediately differentiate a natural release (e.g. naturally occurring anthrax) from an intentional laboratory-borne release, while also shedding light on the technical expertise and resources available to the perpetrator, helping to narrow the pool of potential suspects.

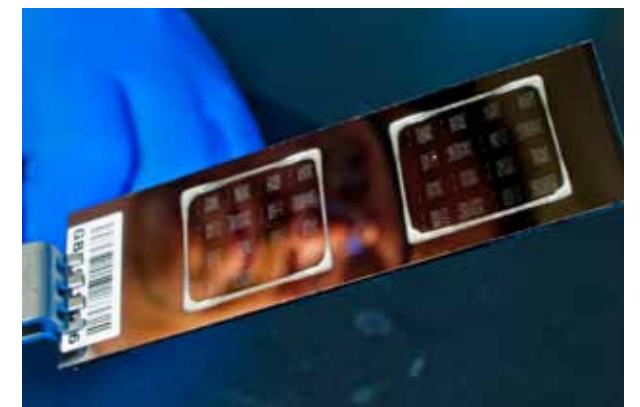
Using the nanofabrication and nanosynthesis capabilities at Argonne's Center for Nanoscale Materials, the biochip can be integrated into a handheld device, giving investigators a biodetection tool that can be used in the field for immediate results. Combining sensitivity with a highly robust, semi-automated platform, the Argonne biochips do not require a specialized laboratory or expensive mass spectral analysis.

## Benefits

- In-depth proteomic analysis provides more detailed forensic information
- Handheld device for rapid in-the-field identification and attribution of biological agents
- Automated, reproducible, robust, high-resolution molecular characterization
- Easily deployed, economical, minimal training required
- Signatures generated through standard biochemical techniques




▲ Molecular biologist Rosemarie Wilton prepares a sample of *B. anthracis* Sterne for testing.



▲ The Argonne-developed biochip can be easily integrated into a small handheld device.



▲ Biochemist Angela Ahrendt performs a proteomic analysis with the biochip.



**“The proteomic analysis that we’re able to perform with our biochips provides a new and different set of information about biological agents than those we’d been able to see before; it can provide us with a complete fingerprint of the organism that we can then use to more precisely identify its origin.”**

- Dan Schabacker, Argonne biochemist

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